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1. A piezoelectric actuator, in particular for actuating control valves or injection valves of internal combustion engines in motor vehicles, having a circular, cylindrical piezoelectric actuator body (1) in the form of a multilayered laminate made up of stacked layers of piezoelectric material with intervening metallic or electrically conductive, alternating first and second electrode layers (10, 11) that function as electrodes, wherein these first and second electrode layers (10, 11) alternately contact a first and second electrically conductive common electrode connection (12, 13), characterized in that the actuator body (1) has an internal longitudinal bore (2) and that at least the first common electrode connection (12) is provided on the inner wall (3) of the actuator body (1) constituted by the internal longitudinal bore (2) and contacts every first electrode layer (10) there.

2. The piezoelectric actuator according to claim 1, characterized in that the second common electrode connection (13) is provided on the outer wall (4) of the actuator body (1) and contacts every second electrode layer (11) there.

3. The piezoelectric actuator according to claim 1, characterized in that the second common electrode connection (13) is also provided on the inner wall (3) of the actuator body (1) and contacts every second electrode layer (11) there.

4. The piezoelectric actuator according to claim 3, characterized in that the first and second electrode connections (12, 13) constitute narrow electrode strips that are disposed diametrically opposite each other and extend in the longitudinal direction of the actuator body (1).

5. A piezoelectric actuator, in particular for actuating control valves or injection valves of internal combustion engines in motor vehicles, having a circular, cylindrical piezoelectric actuator body (1) in the form of a multilayered laminate made up of stacked layers of piezoelectric material with intervening metallic or electrically conductive, alternating first and second electrode layers (10, 11) that function as electrodes, wherein these first and second electrode layers (10, 11) alternately contact a first and second electrically conductive common electrode connection (12, 13), characterized in that the first and second electrode layers (10, 11) are respectively disposed on the outer cylinder wall (4) of the actuator body (1) at points that are angularly offset from one another and contact the first and second electrode connections (12, 13) there.

6. The piezoelectric actuator according to claim 5, characterized in that the points of the first and second electrode layers and the first and second electrode connections (12, 13) in contact with them, which are exposed on the outer cylinder wall (4) of the actuator body (1), are disposed diametrically opposite one another.

7. The piezoelectric actuator according to claim 5 or 6, characterized in that each first electrode layer (10) has a recess (17) which encompasses and insulates the second electrode connection (13).

8. The piezoelectric actuator according to one of claims 5 to 7, characterized in that each second electrode layer (11) has a recess (18) which encompasses and insulates the first electrode connection (12).

9. The piezoelectric actuator according to one of claims 5 to 8, characterized in that the first and/or second electrode connection (12, 13) constitutes a narrow strip extending in the longitudinal direction of the actuator body.

10. The piezoelectric actuator according to one of claims 5 to 8, characterized in that the first and/or second electrode connection (12, 13) constitutes a wider contact surface in the form of a section of the cylinder circumference extending in the longitudinal direction of the actuator body (1).

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Abstract

The invention relates to a piezoelectric actuator, in particular for actuating control valves or injection valves of internal combustion engines in motor vehicles, having a

5 circular, cylindrical piezoelectric actuator body (1) in the form of a multilayered laminate made up of stacked layers of piezoelectric material with intervening metallic or electrically conductive, alternating first and second electrode layers (10, 11) that function as electrodes, wherein

10 these first and second electrode layers (10, 11) alternately contact a first and second electrically conductive common electrode connection (12, 13). Either the piezoelectric actuator body (1) has either an internal longitudinal bore (2) and at least the first common electrode connection (12) is

15 provided on the inner wall (3) of the actuator body (1) constituted by the internal longitudinal bore (2) and contacts every first electrode layer (10) there or alternatively, the actuator body (1) has no internal bore and the first and second electrode layers (10, 11) are respectively exposed on

20 the outer cylinder wall (4) of the actuator body (1) at points angularly offset from one another and respectively contact the first and second electrode connections (12, 13) there. (Fig. 1B)